# Average Power:

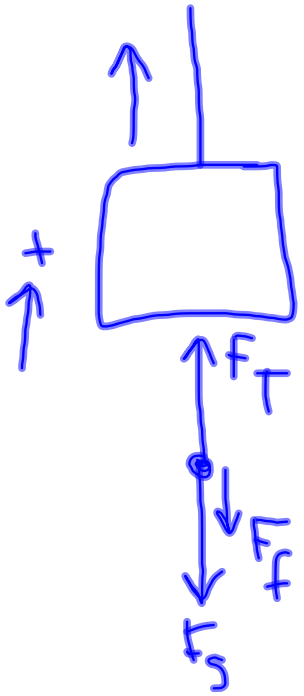
$$P = \frac{W}{\Delta t}$$

unit: $\frac{J}{s} = W$

W : Watt

$$P = \vec{F} \cdot \vec{v} = F v \cos\theta$$

An elevator car has a mass of 1600 kg and is carrying passengers having a combined mass of 200 kg. A constant friction force of 4000 N retards its motion. How much power must a motor deliver to lift the elevator car and its passengers at a constant speed of 3.00 m/s?




$\sum \vec{F} = 0$

$F_T - F_g - F_f = 0$

$F_T = F_g + F_f$

$= 21640\ N$

$P = \vec{F} \cdot \vec{v}$ angle bet. $F_T$ and $v = 0°$

$= F_T v \cos\theta$

$= F_T v$

$= (21640\ N)(3.00\ m/s)$

$= 6.49E4\ W$